

expand by the addition of heat. No liquid is so generally diffused and plays so important a part in the economy of nature as water, which, singularly enough, between certain thermometric limits, is the only exception to this law. From about 32° of Fahrenheit's scale it contracts for every additional increment of heat, until at about $39\frac{1}{2}$ or 40° , it has attained its maximum density. Conversely, in cooling from 40° down to 32° it expands and becomes specifically lighter. If the mass is undisturbed so as to retain the liquid form, it may be seen to expand, even until cooled down to 20° or 25° below the freezing point. Upon this irregularity of contraction manifested by water in cooling, depends the well being of a considerable portion of the organized world. When winter sets in the surface-water of lakes, rivers, &c., begins to part with its caloric by radiation. This loss of heat is accompanied by contraction, increased density and consequent sinking of the heavier particles to give place to the warmer and lighter water which rises from below. This process continues until the mass has fallen to 40° . Then the beneficent peculiarity in question manifests itself. Further, loss of heat from the surface produces expansion, and diminished specific gravity, and the translation of water from above downwards, and from below upwards, ceases. Hence, while the mass of water below maintains a temperature of 40° , the surface-water steadily sinks towards the freezing point, when it is converted into a sheet of ice, which latter is an effectual barrier to the further loss of caloric. Thus, while the atmosphere of any locality suffers a most distressing depression of temperature, the waters of the rivers and lakes enjoy a much more comfortable temperature. Here then is a happy provision for maintaining intact the life of the finny inhabitants of these waters. During the severity of winter, were it not for this peculiar action on the part of water, the bed of the river would be entirely filled with solid ice, and piscatorial life necessarily annihilated. The philosophic mind must see in this physical property of water no merely accidental or chance action, but an adaptation in the inorganic, as positive and intelligential as any presented in the organic kingdom.

J. A. M.

ART. XIV.—*Contributions to Practical Medicine.* By JAMES BEGBIE, M. D., F. R. S. E., &c. Edinb., 1862. 8vo. pp. 318.

A PECULIARITY of English medical literature consists in its numerous collections of monographs, in the form of Society Transactions or in that of papers by distinguished physicians, which originally appeared as contributions to medical journals. In many cases, when first published, they formed the earliest introduction of their authors to the profession at large, and became the basis of an ever widening and strengthening reputation. It is gratifying, when a physician has attained his highest eminence, to examine the steps by which he reached it, to trace in his earlier productions the features of his maturer mind, and note with satisfaction how successfully the fruits of his later experience vindicate the approving judgment which was originally passed upon the work of an author, at the time, perhaps, but little known, or who chose to test his claims to favour by anonymous publications. The papers in the present volume, however, were all, except one, read by their author before the Medico-Chirurgical Society of Edinburgh,

and published in the journals of the day, and while they contributed to elevate him among his immediate associates, they attracted attention, and served to mould opinions upon the subjects they discuss, wherever English medical literature exerts its legitimate influence. They reflect in a striking manner the characteristics of their author. Second to none of those common-sense medical philosophers who imbibed the true spirit of research and reasoning from Reid and Stewart, Dr. Begbie has spread over every page of his writings a hearty and honest tone, which we have reason to believe reflects a sound and genial nature, always on the alert to discern the hidden causes and relations of things, and always brimming over with thoughts which his companions and auditors are eager to possess. Perhaps the reader will best apprehend the character of the volume before us by recalling Dr. Holland's *Medical Notes and Reflections*. Its tone is scarcely less elevated, and it discloses a not inferior discernment; perhaps it differs from the work alluded to mainly in its closer adherence to what are reckoned practical subjects, or rather to a more exclusively practical manner of treating them.

The first paper in the volume, and which, as was stated already, has never before been published, treats of "Gout and the Gouty Diathesis." It is peculiarly interesting from the circumstance that the author, like so many others who have felicitously described the disease from which they chiefly suffered, is himself a victim of gout. If Sydenham drew from his own sufferings and the observations and reflections which they suggested, a picture of the disease which has forever associated his name with its history, we must admit that Dr. Begbie has endeavoured to finish the portrait by adding to it lineaments which are often masked under the guise of different affections, and whose name they bear instead of that which more properly belongs to them. Or, to quote the author's own statement, a summary of the doctrine he defends :—

"The primary effects of the gouty diathesis are those of a poison (uric acid), often slow and insidious, disturbing many functions, chiefly those of the digestive organs, and of the nervous centres; but sometimes more speedy, through its rapid accumulation in the system, engendering active disease in various tissues and organs of the body—the synovial, the mucous, and serous membranes, being peculiarly prone to be affected by it; while the heart, the liver and kidney participate largely in the general disorder." . . . "The altered or contaminated condition of the blood, in the gouty habit, has subsequently an injurious effect, either vitally or mechanically, on the muscular structure of the heart and bloodvessels, by weakening their power, and producing attenuation of their cavities and trunks, and leading to venous congestion and obstruction, and to their consequences, in hemorrhages, dropsical effusions, and similar affections." "Ultimately the heart and bloodvessels, through the continued prevalence of the diathesis, undergo structural changes by the deposition of earthy matter in their coats; and thus gout is intimately allied with palsy, apoplexy, and other cerebral diseases, and with angina, syncope, and rupture, and other fatal cardiac affections."

These passages scarcely display the extent to which Dr. Begbie believes that gout

"May disclose itself in every organ of the body, and complicate and involve every disturbance of the system. It may visit every part and every texture from the crown of the head to the sole of the foot, and molest, and vitiate every function appertaining to life."

He discovers it in the head in the form of intense and continued headache, in fits of giddiness, in transient affections of the senses, and its

intimate association with lethargy and coma in connection with serous effusion, the result of cerebral disease. He detects it in many cases of paraplegia and neuralgia, in otitis, tonsillitis, and relaxation of the uvula, in iritis, and sclerotitis, and in destructive inflammation of the eyeball. It plays a part, he maintains, in many cases of pneumonia, pleurisy, bronchitis, and hydrothorax; it "more than any other agent lays the foundation of irreparable mischief" in the heart and bloodvessels, and is "the immediate cause of some acute attacks of endocarditis and pericarditis."

"Gout," he asserts, "has frequently its seat in the organs of digestion, complicating their functional derangements, hurrying on their structural diseases, and terminating their organic lesions" . . . "is intimately connected with the disorders of the urinary organs; it is frequently the origin of renal disorder, of granular degeneration of the kidneys, and of puriform discharge from the urethra." . . . It "lurks in many functional diseases of the uterus, and discovers itself in some of its organic diseases. It is the fountain of many hemorrhages and many fluxes. It is the origin and essence of many cutaneous eruptions, and in the joints, the fruitful source of crippling, lameness, and deformity."

Truly gout is *fons malorum*! if we accept our author's interpretation of the cases, some of which are referred to in the above extracts. But this we are unable to do. Evidently all of these affections, diverse and even opposite in their nature, occur habitually in constitutions as free from gout as if such a disease had never existed; and if they sometimes are modified or even replaced by an open fit of gout in other cases, it only shows that this disease, like scrofula and other pre-eminently blood disorders, is capable of modifying the phenomena of more accidental affections. The efficacy of colchicum in the cure of such diseases may, and, we respectfully suggest, does prove only this, that the neutralization of the gouty poison permits nature to work her own cure of the affection which this poison maintained and aggravated. Gout, in such cases, we presume, may be regarded as one of the lædientia, the removal of which, in all methods of treatment, is essential to success.

Dr. Garrod, in his well-known work, has devoted a chapter to illustrating the various forms of irregular gout, and he more than intimates a doubt of views like those which are so strongly expressed, and so ingeniously illustrated by Dr. Begbie. Even after admitting that a gouty diathesis may produce symptoms apart from the joints which are essentially of a gouty character, he finds, when he comes to examine the several varieties of alleged irregular gout, that few of them can unequivocally be accepted as of that nature. He is even so irreverent as to quote with approbation Dr. Watson's remark that "the so-called *gout* in the stomach has sometimes turned out to be *pork* in the stomach." Long ago, Dr. Sutton complained that "the idea of this universal influence of the gout has had this effect, that every disease which has happened during an arthritic paroxysm has been considered to be gout." Earlier still the notion which Dr. Sutton reprobates was inculcated by continental writers. But among the most authoritative of recent French and German writers, as Vogel and Lebert, this confusion is criticized in strong terms. Undoubtedly, gout is a constitutional affection (a blood disease, as it is the present fashion to say), and as inborn peculiarities modify the phenomena of accidental diseases, so do acquired morbid habits produce this effect in a still greater degree, and none more so than the gouty habit. But we cannot assent to the view which magnifies a complication, and converts it into an efficient cause.

In reading the paper which treats of the connection of dyspepsia and nervous disorders with the oxalic acid diathesis, we were struck with the same feeling of uncertainty with which long ago the similar chapter in Dr. Prout's work inspired us. While it must be admitted that there are certain marked differences between the two states of the system referred to, it must also be allowed that so many symptoms are common to both, as to render their direct dependence upon the special condition of the blood a matter of serious doubt. In both the following symptoms occur, *e. g.*: A dry and harsh skin, scaly eruptions, feebleness of the lower limbs, hemorrhage from the bowels, disorder of the kidneys and bladder, dyspepsia, flatulence, and palpitation of the heart, irritable temper, hypochondriasis, and, in the gouty diathesis, oxalates and urates alternate with one another. In a word, the points of resemblance of the two conditions are much more numerous than those in which they differ, and much more than would account for the cure of the one by colchicum and of the other by nitro-muriatic acid, if we did not look beyond the minutiae of the cases to see those broad and characteristic features in which they are strikingly contrasted—features which may briefly be described as those of the sanguine and of the melancholic temperament. But this fact, if admitted, does not furnish any clue to the essential differences of the two affections, which must be sought in those metamorphoses into which even the prying eye of organic chemistry has not yet thoroughly searched.

The paper on "the Relation of Rheumatism and Chorea" does not now call for so much attention as it deserved in 1847, when it was first published and when the relation had been noticed by only a few writers. The succeeding one, which treats of "the Connection of Erythema Nodosum with the Rheumatic Diathesis," and through it with uterine disorder, is interesting as an additional illustration of the closeness of relationship which exists between many local affections and certain general states of the system. "Anæmia and its Consequences" is the title of a very important chapter concerning an affection, sometimes described as "exophthalmic goitre," and which the author concludes to be a true anæmia, and curable by the ordinary remedies for that disease. If it were not something more, enlargement of the thyroid body and protrusion of the eyes, with palpitation of the heart would be of frequent occurrence, as frequent as anæmia itself; but, while the latter is every day met with, the former is so unusual as to have passed unperceived by the best observers of disease, until a very recent period. This superadded element has remained in doubt, although announced by various authors as a derangement of the organic nervous system. Meanwhile the clear and circumstantial exposition of Dr. Begbie demonstrates that an essential element of the affection is anæmia. His paper is peculiarly valuable as a history of the progress of observation in regard to exophthalmic goitre, and all who desire to be informed upon the subject, will find it their best guide. It is curious to observe how four of the medical celebrities of Paris, MM. Bouillaud, Piorry, Trousseau and Beau, so lately as a year ago, displayed marvellous ingenuity, and abounded in all the arts of the tribune while defending each his theory of the disease before the Academy of Medicine.

In this discussion we find M. Piorry, with characteristic originality, and with that tenacious adherence to mechanical views of disease for which he is so remarkable, maintaining that enlargement of the thyroid gland is the primary element of the disease, causing in its turn derangement of the heart's action by pressure upon the vascular trunks of the neck and upon

the branches of the cranial and the sympathetic nerves. These influences, according to him, determine imperfect hæmotosis and impair nutrition, while "habitual suffering, defective performance of the great functions, and sometimes congestion of the brain resulting from hindrances to its circulation, render the temper irritable and violent, produce habitual mental excitement, and predispose to anger." Consistently with these theoretical views he pronounces iodine the specific remedy.

M. Bouillaud does not hesitate to deny that palpitation of the heart has any necessary connection with exophthalmic goitre, because it is found in thousands of persons who are neither goitrous nor have protrusion of the eyes. He also ridicules the idea of calling the disease, as described by authors, a neurosis. "A comical neurosis, truly," he exclaims, "for according to the received nomenclature, a neurosis is a disease without visible lesion." After denying any necessary connection between the three characteristic elements of the affection, he concludes by attributing it chiefly to the habit of self-abuse. The connection between the disease and its alleged cause he confesses his inability to point out. In a note he makes, in a single line, a statement which is, perhaps, of more consequence than all the rest of his long and verbose oration. "We have shown," he remarks, "that the cardiac palpitations denote a nervous excitability coinciding with a state of chloro-anæmia." Taking so different a view as he does of the nature of the disease from that of M. Piorry, he, nevertheless, advocates the use of the same remedy, viz., iodine.

The oration of M. Beau is taken up with a lucid demonstration of the dependence of the functional symptoms of the disease upon anæmia, which, he contends, is associated with transitory hypertrophy of the heart. Unfortunately, he throws no light at all upon the causation of the projection of the eyeballs nor on that of the enlargement of the thyroid gland. It is not sufficient to say that those phenomena are sometimes absent. Usually they are not so; and the cause of their presence when they do occur is precisely what we desire to learn. A very important statement made by M. Beau, is that having carefully inquired into the causes to which the development of the disease was due in seven cases, he found them all to be such as affect the feelings deeply, as reverses of fortune, disappointed affection or ambition, &c. Against such causes, he very justly remarks, the *materia medica* contains no antidote.

The discourse of M. Trousseau was distinguished by that elegance and brilliancy which are the characteristics of his style, and which subject him to the criticisms of brother Academicians who may use language as keen and trenchant, but certainly neither so dazzling nor so clear. It was the first in order, but, as the most important, we have reserved it for notice until the last. Instead of assigning anæmia as the primary link in the chain of morbid conditions, he declares that nervous disorders, mental, gastric, or uterine precede or accompany the three characteristic phenomena of the disease; but the primary symptom is excessive action of the heart. This symptom he refers to disorder of the great sympathetic nerve, citing in explanation of his doctrine, the experiments of Claude Bernard. To the same disorder he attributes all the symptoms displayed by the great vessels, the digestive organs, the kidneys and the eyes, as well as the congestive enlargement of the thyroid body. Between him and M. Beau the most conspicuous difference is that the latter regards anæmia as the primary element of the affection, while the former holds it to be a consequence of the deterioration of nutrition produced by nervous derangement. Probably the condition of

the blood and that of the nervous system are so closely associated that one cannot be impaired without injury to the other; yet, taking the cases of M. Beau as evidence, the latter would appear to be the first affected, as M. Trousseau maintains. Such a conclusion is arrived at by Prof. Laycock in a paper, the essential portion of which is reprinted in the present number of this Journal. It may be remarked that M. Trousseau declares no benefit is to be derived from the use of iron in this affection, but, on the contrary, that it aggravates the symptoms; that according to him iodine will equally exasperate them; and that the most successful remedy is digitalis associated with such measures as are adapted to restore the suppressed menses.

The paper on "Fatty Degeneration of the Heart," particularly as a cause of sudden death, is peculiarly interesting from its containing an account of the sudden death of two great illustrations of Scottish literature and science, Dr. Chalmers and Dr. Abercrombie, who both fell victims to this disease. The essay on "Erysipelas" contains, we believe, one of the earliest evidences of the efficacy of muriated tincture of iron in this affection, although the author associated with it other remedies which he would probably, at this day, consider superfluous if not injurious. In like manner, Dr. Begbie appears to have seized the just idea of a pathology of "Diphtheria and its Sequels," when he contends for its being a toxæmic disease, and not a local inflammation. His essay on the "Therapeutical Effects of Arsenic" is one of the wisest that has been published in regard to this powerful agent; and although it does not profess to furnish any novel results, it tends to rationalize our use of the remedy, by showing the common elements belonging to the diseases which it is adapted to cure. The employment which he recommends of it in chronic bowel complaints is worthy of the attention of our physicians who have the care of patients affected with these disorders contracted during the hardships and complicated sicknesses of camp life. A paper "On the Sedative Powers of the *Datura Stramonium*" closes the volume. It may serve to recall the earlier results of its use in neuralgic and rheumatic affections.

In conclusion, we can only repeat the expression of high appreciation which we entertain of these essays, stamped on every page with marks of the author's thoroughly sound sense, and of his acute perception of the essential elements of certain diseases, and of those which they possess in common with others, which, at first sight, contrast with, more than they resemble them.

A. S.